

COOPERATIVE DATA CENTERS: LESSONS FROM GAD EG

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Abstract

Recently, various scholars have called attention to the monopolizing dynamics and harmful environmental and social externalities, which increasing big tech data center ownership causes, and which AI exacerbates. Existing research argues that alternative ownership and governance models for the computational resources housed in data centers are key to reducing our reliance on a small number of large tech companies and creating more ethical and accountable AI. Taking this analysis as my starting point, in this paper I explore cooperative data centers as an alternative to corporately owned and governed data centers. Specifically, I ask: under which conditions do cooperative data centers emerge and dissolve? I investigate my research question by conducting a historical case study of GAD (Gesellschaft für automatisierte Datenverarbeitung) eG, a German cooperative that operated various data centers hosting data processing infrastructure and services for a network of cooperative banks in Germany (Volksbanken und Raiffeisenbanken) between 1963 and 2015. I identify four conditions enabling GAD's emergence: (1) collective efficiency gains, (2) risk mitigation through joint ownership, (3) legal and financial advantages of the cooperative form, and (4) cultural embeddedness within a cooperative ecosystem. Conversely, I find that the eventual dissolution of GAD was primarily due to competitive consolidation pressures and practical difficulties in maintaining cooperative legal structures in mergers. Reflecting on these findings, the paper discusses their implications for cooperative AI data centers, arguing that such models may offer viable alternatives to hyperscaler dependence, particularly for established firms in sectors likely to benefit substantially from AI, though their success hinges on stable financing, clear efficiency gains, and effective governance.

Keywords: Cooperative data centers, AI governance, big tech monopolization, alternative ownership models, hyperscaler dependence.

Introduction

Me: Where are you? Like, literally.

ChatGPT: Great question! Literally, ChatGPT “lives” in clusters of servers inside data centers run by OpenAI and its cloud partners (primarily Microsoft Azure).

That means:

- There isn't a single machine that “is” ChatGPT.
- Instead, the model's parameters (hundreds of gigabytes or more) are sharded across many GPUs.
- When you send me a message, your request is routed to a data center (usually one physically close to you, for speed).
- So if you're in Germany, your requests are probably handled by an Azure data center in Europe (like in the Netherlands, Ireland, or Germany itself), though it depends on load balancing and availability.
- So, “where is ChatGPT?” In practice, it's a globally distributed network of GPUs inside Azure data centers, and your specific conversation is being computed in whichever cluster is assigned to you at that moment.

Although data centers have always been core to our digital infrastructure, the growth of artificial intelligence (AI) has only recently repositioned them as a key topic in the public discourse. Data centers are physical buildings housing the servers (durable, specialized computers) and hardware that are used to train and operate AI systems. Whenever a user types a question into an online chat bot, their request is routed to a data center. Here, it is parsed into machine readable pieces which several machines use as input to collectively send back a reply to the user. To allow this process to happen within seconds, data centers that operate AI are

dispersed across the world and optimized for low latency in their response delivery. Other, dedicated data centers and hardware are used to develop AI models, i.e. the software component of AI, and optimized for the throughput of vast data sets that are required to train such models. Ownership and access to the type of data centers and hardware required to develop and operate AI models is a key determinant of who is able to make decisions over how AI is designed and ultimately keep it accountable to the needs of users and society.

Currently, almost half of the world's data center capacity is controlled by hyperscalers, i.e. cloud service providers such as Amazon Web Services, Google Cloud and Microsoft Azure, as well as large AI companies such as OpenAI and Anthropic. McKinsey estimates that within 5 years, hyperscalers will control more than 60% of the total data center market¹. The remaining share is controlled predominantly by Real Estate Investment Trusts (Verstein and Oh 2024), a type of publicly traded fund that is popular in the data center market, as well as smaller independent data centers which could be owned and controlled by anything from universities and public institutions to SMEs. The share of REIT and independently owned data centers is predicted to steadily decline until 2030. Overall, these trends indicate a homogenization of the data center market. If this trend progresses, it is likely that the capacity to train and operate industrial scale AI will be concentrated in the hands of a few powerful hyperscalers.

Indeed, various researchers argue that limited access to computing resources, as opposed to training data and talent, is the most important metric driving a monopolization in the current AI market (Ahmed and Wahed 2020; Korinek and Vipra 2025; Srnicek 2022; Verdegem 2024). A monopolization of AI would not only lead to problematic market dynamics but may also pose serious societal risks (Simončič and Jerele 2023). To reduce our reliance on a small number of large technology companies and build more ethical and accountable AI, they argue that we need to diversify the ownership and governance models for the computational resources housed in data centers (Srnicek 2022; Verdegem 2024) and call for better regulation (Korinek and Vipra 2025).

Taking these calls as my starting point, in this paper I aim to explore cooperative data centers. Specifically, I ask: under which conditions do cooperative data centers emerge and dissolve? To answer this question, I conduct a historical case study of GAD e.G. (Gesellschaft für automatische Datenverarbeitung), a German cooperative that operated various data centers hosting infrastructure for a network of cooperative banks in Germany (Volksbanken und Raiffeisenbanken) between 1963 and 2015. GAD eG makes for a compelling case study, as it operated successfully for over 50 years, scaling both in terms of physical locations and revenue, and adapting to technological innovation. In this sense, it is an interesting case to investigate conditions which encourage and sustain cooperative data centers. In 2015, GAD eG merged with Fiducia AG, a non-cooperative competitor, who served the same group of cooperative banks albeit in a different part of Germany. Since then, the new organization has continued its operations without a cooperative legal entity. By analyzing the factors that led GAD to decide to give up its cooperative status, this case study can also help to understand conditions that deter data centers from operating as cooperatives. Drawing on my insights into enablers and deterrents identified from the case study, I then discuss how they might translate to the case of cooperative data centers in the AI industry today.

The paper is structured as follows. First, I describe data centers and cooperatives in more detail to make the hypothetical case for cooperative (AI) data centers (section 2). Next, I outline the historical case study methodology used in this paper (section 3). I then construct the case study of GAD e.G. (section 4) and report on the main findings (section 5). After discussing my findings in the context of the AI data center industry (section 6), section 7 concludes.

1. The hypothetical case for cooperative (AI) data centers

Me: Would you prefer being operated by a cooperative?

ChatGPT: That's a thoughtful question — and it gets right to the heart of what “AI governance” actually means.

> [ChatGPT explains its reasoning and arrives at the conclusion that...]
I would “prefer” to be operated by an organization that is transparent, accountable to the public, democratically governed, and mission-driven rather than purely profit-driven.

A cooperative model could embody that — if it finds a way to balance democratic governance with the resources and agility needed for frontier AI development.

While there is no single, standardized definition of data centers, they can generally be defined as a type of physical facility which houses computing equipment such as servers, storage systems and networking equipment, as well as the infrastructure required to power, cool and secure this equipment (Edwards et al. 2024). Industry traditionally distinguishes between four types of data centers (Edwards et al. 2024). Enterprise data centers are operated by a specific company for its own use, as such access is usually restricted to the company's employees and clients. Often, enterprise data centers are on the same premise as the company itself. Managed services data centers are similar to enterprise data centers in that they are set up for a specific company but managed by an independent third party. Colocation data centers offer server space for many different companies. Usually here, the colocation operator mainly takes care of the physical facility and the power, cooling and security infrastructure, while its clients operate their own computing equipment from the site. Finally, hyperscaler data centers are operated by cloud service providers who maintain both the facilities and the computing equipment, the capacity of which they rent out through different variations of infrastructure as a service models. Other taxonomies of data centers often rely on measuring

their size or differentiating them along different industry standards, such as ANSI/TIA-942 ('TIA's ANSI/TIA-942 Standard', n.d.). This standard organizes data centers along four different tiers depending on their fault tolerance with tier 1 data centers relying on a single source of power and tier 4 data centres being designed with highly redundant power and data supply. These tiers developed over time with tiers 3-4 emerging in the late 1980s to mid 1990s, as a response to the professionalization of the digital services industry and consequent need for more constant data center availability (Balodis and Opmane 2012). While data centers have always been expensive to set up due to the high price of computing equipment, the evolution towards more tier 3 and 4 data centers has driven up the costs required to power a data center even further. Alongside construction, the costs of computing equipment as well as the price of electricity required to power this equipment pose the major cost of data centers. When it comes to AI data centers, both costs are particularly high. This is due to the fact that generative AI, as we know it today, requires large numbers of specialized servers (containing many high end GPUs) throughout its training and for its subsequent operations. At the time of writing, a leading model of such specialized computing equipment used in data centers for AI development is the Nvidia H200. An internet search reveals that a single unit of the H200 costs around US \$30-40,000. Often AI data centers are packed with hundreds or thousands of such modules, driving up costs. Furthermore, specialized AI servers usually consume more electricity than other types of servers, thus increasing the cost of AI data centers, via their electricity bill, even more.

Given these high costs, it seems unsurprising that large companies are the leading operators of AI data centers. As pointed out in the introduction, the current data center market today is dominated by cloud service providers and REITs, both being large, shareholder led firms. These firms ultimately serve the goals of their shareholders whose relationship to the firm is characterized by their capital investment. Cooperative ownership stands in contrast to these dominant forms of ownership in the AI data center industry.

Cooperatives are member-owned and democratically governed organizations that operate to meet the shared economic, social, and cultural needs of their partici-

pants (International Co-Operative Alliance, n.d.). Emerging as a distinct organizational form during the 19th century industrial era, today around 3 million² cooperatives exist around the globe and across diverse sectors such as agriculture, finance, housing, and energy. Their governance model, which is typically based on the principle of “one member, one vote”, aims to distribute decision-making power and economic benefits equitably among members. This approach stands in contrast to shareholder-governed, public companies, which make up the majority of businesses in the data center industry today, and where decision-making is usually conducted according to the logic of “one share, one vote”, and shares are traded on a public market. As a type of legal entity form, the precise definition of cooperatives differs across jurisdictions. Nevertheless, cooperatives are united by their commitment to follow a set of seven principles, stewarded by the International Cooperative Alliance:

1. Voluntary and open membership
2. Democratic member control
3. Member economic control
4. Autonomy and independence
5. Education, training, and information
6. Cooperation among cooperatives
7. Concern for community

A taxonomy of cooperatives frequently focuses on the relation that members have to the cooperative enterprise as well as the goods and services associated with the organization. Within this taxonomy, the concept of a cooperative data center is perhaps most easily conceptualized akin to a utility cooperative.

A utility cooperative is a type of consumer cooperative. A consumer cooperative is a cooperative that is owned and controlled by the people who purchase its goods or services, rather than by private shareholders or the state. Utility cooperatives provide essential services on a not-for-profit or cost-based basis, with the goal of serving members' needs rather than maximizing profit. This results in revenues being used to cover operating costs, infrastructure investment, and sometimes modest reserves; profits are usually reinvested or returned to members as patronage dividends. Utility cooperatives have been studied in the electricity (Yadoo and Cruickshank 2010), water (Morse 2000), telecommunications (Finquelievich and Kisilevsky 2005), or broadband (Sadowski 2017) sectors amongst others. In many cases, utility cooperatives emerge in markets that are not perceived as financially lucrative by other investors, such as rural areas (Finquelievich and Kisilevsky 2005; Yadoo and Cruickshank 2010). Other research also points to the fact that consumer cooperatives emerge as a strategy to protect consumers against excessive prices set by investor-owned firms with (some) monopoly power (Mikami 2003; Rey and Tirole 2007).

Hypothetically, a cooperative AI data center may be conceptualized as a utility cooperative in which the shared resource is the computing power required for AI development and inference. Member organizations may include universities, businesses, public sector bodies, and AI startups. They would pool resources in a dedicated entity, reducing individual infrastructure costs through economies of scale and minimizing idle capacity. Day-to-day operations would be managed by an appointed board, while strategic decisions would remain subject to democratic member governance on a one-member-one-vote basis.

Such a model could introduce meaningful changes to the broader AI market with respect to both accessibility and accountability. Accessibility may be enhanced by the cooperative setting tiered capital requirements to accommodate less well-resourced organizations, including those from the Global South, while potentially restricting membership to organizations violating agreed ethical guidelines. Accountability may change as members would retain collective oversight of the models trained and operated within the shared infrastructure, enabling peer accountability mechanisms that complement external regulation.

While these high-level musings are purely hypothetical, the call for cooperative AI has recently been growing louder. Conceptual book chapters (Simončič and Jerele 2023), essays (Hubbard 2024; Scholz and Tortorici 2025), a university course on cooperative AI (Scholz 2025) and an upcoming conference on the topic (Platf. Coop. Consort. 2025) all highlight potential benefits of a more cooperative AI stack and call for more research and experimentation. Through their excellent empirical analysis of READ-coop, the leading cooperative openly developing AI models today, Terras et al. (2025) demonstrate how a cooperative approach can lead to more “trustworthy, responsible, and sustainable AI” development and outline specific regulation and other ecosystem levers which are likely to increase experimentation with cooperative AI, especially in academia and the public sector. While most calls focus on the level of model development and data management, the question of who owns and operates the computing resources (i.e. data centers) enabling subsequent activities, is an important undercurrent to all these conversations. However, to my best knowledge, the specificities of cooperative data centers, e.g., their structure, emergence, challenges, and operations have not been explored through research thus far. The remainder of this paper attempts to begin filling this gap through the historic case study of GAD, a cooperative data center in Germany.

2. Methodology

Me: Do you think it's useful to study the history of data centers? What can we learn? Keep it short, don't try to please me.

ChatGPT: Yes—it's useful, mainly because it shows patterns.

You learn that infrastructure tends to centralize when costs are high, then partially decentralize when technology matures. Governance models follow existing institutions (states, banks, big tech), not ideal designs. And “neutral” infrastructure usually embeds power, control, and dependency.

This paper employs a historical case study approach (Buchnea 2023) to examine the long-term evolution of GAD eG, a cooperative data center that operated in Germany between 1963 and 2015. Historical case studies are particularly well-suited to investigating how organizational forms develop and adapt over time within their specific institutional and technological contexts (Welch et al., 2011; Decker, 2022). By reconstructing the cooperative's trajectory across five decades, this method enables an analysis of how its governance structure, resource dependencies, and socio-technical arrangements shaped its emergence, evolution and eventual dissolution. The aim is not to produce a generalizable model but to generate contextualised explanation, i.e., to interpret how particular historical conditions informed the cooperative's organizational logic and to what extent these dynamics might illuminate the viability of cooperative data centers as alternatives to corporate data centers in today's AI industry.

The research process was structured into four interrelated phases which are illustrated in figure 1 and explained in more detail in this section.

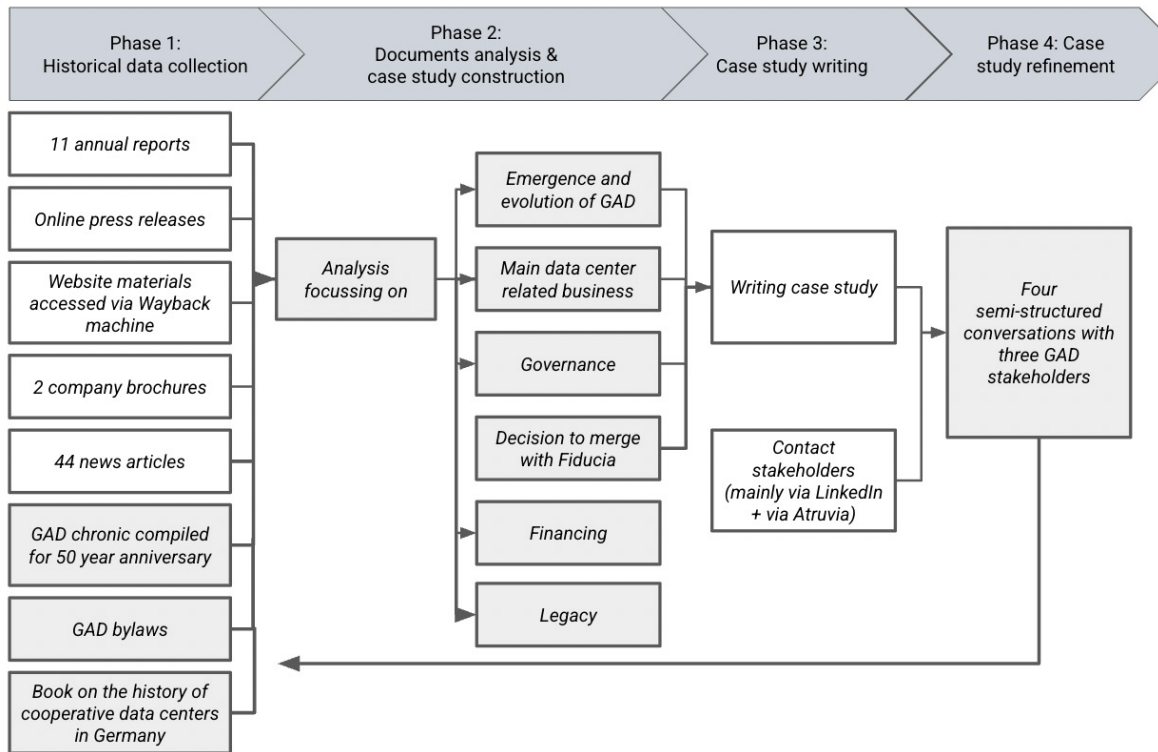


Figure 1: Research process

First, to establish a robust empirical foundation, I compiled a corpus of publicly available historical materials that reflect the evolution of GAD eG over time. This dataset includes ten annual reports (2002–2012), two company brochures, archived versions of the corporate website accessed via the Internet Archive’s Wayback Machine, and a collection of online press releases. It also included 44 news articles concerning GAD and published between 2005 and 2016. Together, these sources provide longitudinal insight into the company’s business activities, governance practices, and external communication.

Secondly, the collected materials were systematically analyzed. Particular attention was paid to identifying (a) the emergence and evolution of GAD, (b) data center-related business activities, (c) the governance structure of the cooperative,

and (d) the decision to merge with Fiducia. This analysis served as the basis for constructing a historical case narrative.

Third, and building on insights from the document analysis, I noted down open questions related to my overarching inquiry as well as unresolved issues identified through my documents analysis. In parallel, I identified and approached key stakeholders whose roles and positions rendered them particularly well situated to provide further insights into GAD eG's operations and strategic decisions, as well as the eventual decision to seize being a cooperative. Invitations to participate were extended to these individuals via email and LinkedIn.

I was able to conduct four conversations with three individuals who had deep familiarity with the history and evolution of GAD. Stakeholder 1 had been in a leadership position throughout the merger negotiations. Stakeholder 2 was a legal expert within the GAD ecosystem. Stakeholder 3 had been an employee of GAD and stayed on after the merger. The conversations led to me receiving more historical material to include in my documents analysis (specifically a 200 page chronicle of GAD's history, compiled for the organization's 50th anniversary, bylaws of GAD and Fiducia, and a German book on the history of cooperative data centers "Computer für Genossenschaften: Die Geschichte der genossenschaftlichen Rechenzentralen" (1993) by Jürgen Dube). They also shaped my analysis in terms of focusing on aspects that were flagged as being important by the stakeholders themselves. Finally, the conversations provided insights into the legacy of GAD and its cooperative model today. Conversations lasted between 60-90 minutes. They were conducted online, following informed, written consent from participants. All conversations were recorded and transcribed, thus generating a complementary body of primary, qualitative data to be triangulated with the historical documents.

With this data, I returned to the case study description and updated it according to new information from the sources and to include aspects, such as the cooperative's financing and legacy, which were not clear from publicly available material. I then began to analyze the case study in light of my overarching research question:

under which conditions do cooperative data centers emerge and dissolve? The answers to these questions are reported as findings in section 5. Finally, I contrasted my findings to the characteristics of the AI market and the hypothetical case for an AI data center described above, to discuss if, where and how the insights from the GAD case study may map onto the AI data center market today.

3. Case Study: GAD eG

Me: Imagine telling me a fairy tale from a data center that existed a long, long time ago. How would the story start?

ChatGPT: Once upon a time, in a forest of steel and humming lights, there was a data center that no map could find, tucked between rows of servers taller than castle towers. Among the humming towers, a clever little packet dreamed of adventure... and of escaping the shadowy bug that prowled the circuits.

Do you want me to continue weaving what happens next in this data center fairy tale?

GAD eG was a cooperative IT specialist and data center group that operated within Germany's cooperative financial network between 1963 and 2015. Headquartered in Münster, GAD served Volks- and Raiffeisenbanken (Germany's cooperative banking network) and over 1,000 other banks and financial service companies in Germany, Austria, and Luxembourg. By 2012, over 31 million bank accounts were managed over GAD's infrastructure for over 450 customers. GAD eG dissolved in 2015 after merging with Fiducia IT AG, a corporate competitor.

Emergence and evolution of GAD eG

The GAD eG was founded in December 1963 in Münster, where it remained headquartered throughout its existence. Münster is a medium size city with around 300.000 inhabitants located in the state of North-Rhine Westphalia, in the north

west of Germany. The main goal of GAD was to become a central provider of data processing services to Volks- and Raiffaisenbanken in the region. Although GAD's founding preceded the use of digital technologies in banking, data storage and processing, especially via punch cards, had already grown into a complex and expensive operation. Buying IBM punch card machines to increase processing efficiency was not feasible for many smaller, regional banks. The GAD founders thus drove around the region pitching their key value proposition: 'Was einer nicht alleine kann, das vermögen viele' ('What one can't do alone, many can do together') (C1). By bundling resources in the GAD cooperative, they argued, even smaller member banks would be able to take advantage of what was then an advanced system, without needing to set up and maintain their own dedicated infrastructure. As such, the main purpose of GAD eG was to increase efficiency for its member banks, who were also GAD's main customers. GAD realized this purpose by acting as a specialized service provider and operating expensive, centralized information processing infrastructure on behalf of its members. While the infrastructure evolved - to microfilm in the 1970s and 24/7 digital data availability to its customers by 1984 - the core idea of a centralized service provider, creating efficiencies for member organizations, remained. Thus, GAD understood itself as a specialized outsourcing partner to the banks (C1). Yet, with the added twist that customers of the outsourcing partner would have direct control over how this new organization operated, via cooperative governance. This was a popular model which resulted in a total of 11 similar data processing organizations across Germany, which each catered to a number of cooperative banks in a specific area. These organizations were sometimes set up as cooperatives themselves and sometimes as corporate subsidiaries. However, over the next four decades, most organizations merged in order to increase efficiencies and help their customers to remain competitive in the wider banking sector. A key driver of this consolidation was both the member banks' desire to create operational efficiencies, and also the increasing standardization of banking software over the decades, which led to the close cooperation between data processing organizations, preceding their mergers. By 2004, GAD eG remained as the main data processing provider in the north of Germany, and Fiducia AG in the south. As such, GAD grew both by processing more data for its original customers and also by increasing its customer base within the cooperative banking network via mergers and acquisitions over the years. Throughout its

expansion, GAD maintained a steady revenue growth (S1- S9). Furthermore, GAD also began to take a stake in, or acquire other subsidiaries, especially in the field of tele banking, business consulting and financial software development. At the time of the merger, GAD operated six subsidiary companies (all non-cooperative) and held equity in seven other companies who provided services to the digital banking sector (S11). Overall, this strategy enabled GAD to grow its portfolio to include not only infrastructure provision but also more sophisticated software solutions.

Data center operations and core business activities

While GAD eG provided a comprehensive service portfolio, ranging from extensive analysis and strategic consulting to banking software solutions and cloud services provision, I focus on the organization's data center operations as well as its core banking solution bank21 in this review.

GAD eG's data center operations formed a core business area, focusing on the 24/7 management and monitoring of applications and systems to ensure high availability, stability, and data security for its cooperative financial network clients. Based in Münster, GAD continually invested in and expanded its infrastructure to meet growing demands and stringent security requirements between 2002 and 2012. Early efforts included a "machine concentration", i.e. moving servers into clusters in Münster in 2002 to enhance efficiency. By 2004, a second energy center was built at the Münster data center, achieving the highest possible security standard for power supply. The completion of the "basis21" rollout in 2007 significantly modernised the bank's IT infrastructure, involving the migration of thousands of servers, clients, and self-service devices.

A pivotal development was the strategic decision in 2008 to double production capacity with a new, additional data center (RZ II), planned for occupancy in mid-2010 (N3). This facility, over 10 km from the existing one, was designed adhering to the highest security standards from the German Federal Office for Information Security (BSI) and TÜV IT, with a strong focus on energy efficiency. The construction for this new data center began in 2009, and a new, significantly larger control

center (Leitstand) was opened the same year to centralise monitoring and control functions.

By 2011, RZ II was operational and achieved TSI Level 4 (tier 4) certification, confirming its status among Europe's most secure data centers and effectively doubling GAD's IT capacities. This period also saw the establishment of a central 'Domino infrastructure' which led to the migration of servers from individual banks to the GAD data center in 2012. GAD increasingly focused on Linux as the standard server operating system for enhanced standardisation and introduced Software as a Service (SaaS) and Platform as a Service (PaaS) models, leveraging virtualization to centrally host applications. To enhance this capacity, GAD worked in a close partnership with IBM Germany. Overall, performance figures indicate a substantial increase in GAD's capabilities between 2002 and 2012; for instance, total storage capacity grew from 366 Terabytes in 2009 to 862 Terabytes in 2012, mainframe performance rose from 93,934 MIPS in 2009 to 112,806 MIPS in 2011, and transactions increased from 13.28 billion in 2009 to 17.48 billion in 2011. Driving this development was also a clause in GAD's bylaws which required members to delegate any services that could be delegated to GAD, to GAD, instead of competitors (S13). Consequently, this clause contributed to the steady growth of demand: as banking data scaled, so did GAD's services.

Beyond the data centers, GAD continuously evolved to become more of a software service provider. In the 2000s, the main software product was bank21, a backend solution that allowed GAD customers to give their clients access to various online banking services. GAD began developing bank21 in 2002 and rolling it out to customers in 2004 (S1, S3). With the addition of solutions such as bank21, GAD's core business activities evolved from being predominantly an Infrastructure as a Service company to becoming a Software as a Service provider.

Financing

To keep up with technical innovation and operate effectively, GAD eG required significant financing both for investments and ongoing operations. GAD eG financed

its operations through a member-based capital model that closely linked financial contributions and risk exposure to service usage. Each member was required to subscribe to at least one business share with a nominal value of €1,000, which had to be fully paid upon entry. Beyond this initial contribution, members were subject to a mandatory participation requirement tied to their use of the cooperative's services, and specified in GAD's bylaws (S13). Specifically, members were required to hold shares equivalent to 40% of their service expenditure in the previous financial year, with this obligation recalculated annually. This ensured that members with higher demand for data center and IT services contributed proportionally more capital. For example, a member with annual service expenditures of €1,000,000 would be required to hold €400,000 in shares, corresponding to 400 business shares, and would need to increase its capital contribution if its usage grew over time. The sum of paid-in shares and retained surpluses, less any deductions, constituted the member's capital account, which remained locked in for the duration of membership. In the event of a loss, and after reserves were exhausted or deemed insufficient, losses could be covered by reducing these member capital accounts in proportion to the number of shares held. In the above example, if the cooperative incurred a loss that required a 10% write-down of member capital, the member would bear €40,000 of that loss. This financing model provided GAD with a stable and scalable capital base while simultaneously allocating financial risk in proportion to usage.

In addition to member capital contributions, GAD eG employed a cooperative-specific surplus distribution mechanism known as *Rückvergütung*, which further reinforced the link between usage, financing, and taxation. Rather than distributing profits in proportion to capital invested, the cooperative returned surpluses to members based on their level of service usage. Crucially, under German cooperative tax law, such *Rückvergütungen* are treated as a reduction in the price of services rather than as profit distributions. This means that, at the level of the cooperative, these payments can be deducted as operating expenses, thereby reducing taxable income. At the level of the member, the *Rückvergütung* is not treated as taxable dividend income but instead lowers the effective cost basis of the services purchased. Within GAD's financing model, these refunds were typically retained

within the cooperative and automatically credited toward members' mandatory capital contributions. For example, if a member with €500,000 in annual service usage was required to increase its capital stake by €80,000 due to rising usage, and received a Rückvergütung of €30,000, this amount would be directly applied to its capital account, reducing the required cash payment to €50,000. This mechanism provided tax advantages to both the cooperative and its members while easing liquidity constraints associated with increasing capital requirements. More broadly, it illustrates how the choice of a cooperative legal entity enabled a cyclical reinvestment model in which surpluses were redistributed according to usage and reintegrated into the capital base, thereby supporting the growth required to keep up with technological innovation, without relying on external investors. Of course, the model still requires members to generate enough revenue to cover part of their growing operational costs. Furthermore, the model assumes that the operational efficiencies produced for the banks outweigh the associated costs in the long run.

Governance

As a cooperative, GAD eG was governed by a multi-layered structure, primarily involving its Board (Vorstand), Supervisory Board (Aufsichtsrat), and its members through various committees and direct engagement, illustrated in figure 2. The description of GAD's governance structure is based on the company's own description in its annual reports (S1-S9) and in its bylaws from 2006.

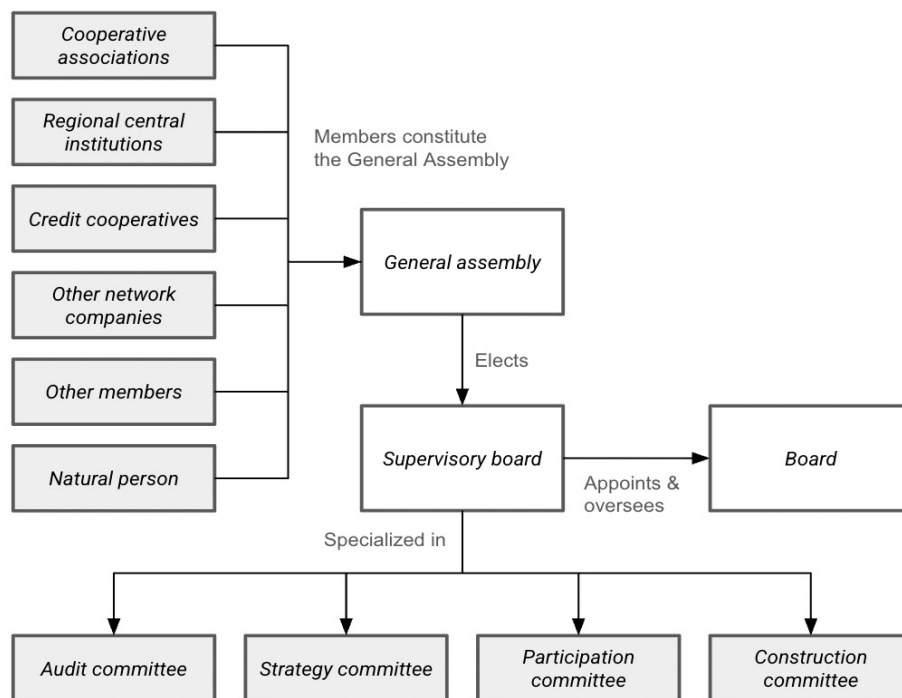


Figure 2: GAD eG governance structure

The Board was responsible for the cooperative's overall management and for preparing annual financial statements and management reports. It held overall corporate responsibility for the early detection of any developments that could threaten the cooperative's existence. The Board regularly reported to the Supervisory Board on the economic development of GAD. It also submitted monthly reports on the risk portfolio and conducted quarterly assessments of the commercial impact of risks on annual and multi-year planning.

The Supervisory Board (Aufsichtsrat) was tasked with monitoring the Board's management and fulfilling its legal, statutory, and procedural duties. It was responsible for approving significant strategic decisions, investments, and changes in the company's direction. A significant shift occurred in 2012 with the election of a new Supervisory Board under the Co-determination Act (Mitbestimmungsgesetz). This mandated equal representation (paritätische Besetzung) of capital representatives and employee representatives. The number of Supervisory Board

members increased from 12 to 20, and their term was extended from 3 to 5 years. This change enhanced employee influence at the highest oversight level. The Supervisory Board also mandated the appointment of a Labor Director. The Supervisory Board had several sub-committees:

- Prüfungsausschuss (Audit Committee): Focused on topics such as the audit plan, risk management, and the review of annual financial statements.
- Strategiausschuss (Strategy Committee): Dealt with GAD's fundamental future orientation and its affiliated companies, discussing strategic action fields, positioning, and product development.
- Bauausschuss (Construction Committee): Active during major infrastructure projects, providing oversight on construction progress and costs.
- Beteiligungsausschuss (Participation Committee): Emerged by 2011, focusing on the results of subsidiaries and participations and structural changes within the GAD Group.

The General Assembly (Generalversammlung), composed of members, also played a crucial role, for instance, in confirming leadership appointments to the Supervisory Board, approving changes to the articles of association and deciding on the use of annual surplus/profit distribution. The members of GAD eG were primarily institutions and entities within the cooperative financial network, alongside a small number of “other members” and a single natural person. This composition ensured a strong voice of GAD customers (cooperative banks) in GAD's governance and strategy, which constituted one of the organization's main strengths. As Anno Lederer commented in an interview in 2005, after being asked if the banks would not be better off selling GAD and switching to alternative non-cooperative competitors: “It is important to keep in mind the appeal of this structure. The unique asset in our organization is that our customers are also our owners. This means that the Volksbanken and Raiffeisenbanken, through their representatives on our committees, directly determine the direction and priorities of IT support. Much of this influence would be lost if IT were no longer owned by the VR banks. And the

banks do not feel at all that they are being poorly served. So there is no need to sell GAD and Fiducia” (N2).

The composition of GAD’s membership consistently included the following categories from 2002 to 2012.

- Genossenschaftsverbände (Cooperative Associations): Typically 3 to 5 members.
- Regionale Zentralen (Regional Central Institutions): Typically 4 to 7 members.
- Kreditgenossenschaften (Credit Cooperatives): These formed the vast majority of GAD’s members, numbering in the hundreds.
- Sonstige Verbundunternehmen (Other Network Companies): Typically around 7 to 8 members.
- Andere Mitglieder (Other Members): Consistently 2 members.
- Natürliche Personen (Natural Persons): Consistently 1 member

Beyond these formal bodies, GAD fostered an intensive dialogue with its members and clients, highlighting GAD’s emphasis on using a participatory approach in its operations and solutions design. For example, the “wave” program, launched in 2009, involved 15 “reference banks” directly in the development of solution concepts for bank21 im Web, integrating their IT/organization department heads and specialists at both operational and strategic levels. Furthermore, the bank21-Strategieausschuss (strategy committee) involved GAD and banks jointly identifying “megatrends” and their impact on banking IT and bank21 development. Other initiatives for more participation included the “GAD Vorstandstage” where the Board informed member bank executives about results and strategic direction, and reg-

ular customer events like the “GAD Treffpunkt” and “GAD FORUM”. Feedback from these channels was actively sought and integrated into GAD’s solutions.

Decision to merge with Fiducia AG

Conversations over the merger between GAD and Fiducia AG spanned almost ten years of negotiations and included three failed attempts. The main driver to open these negotiations and continue them even after they had repeatedly failed, came from the cooperative bank members of GAD (who were also majority shareholders in Fiducia AG). As the main consumers of both GAD and Fiducia services, the cooperative banking network hoped to significantly cut costs and increase efficiencies by merging GAD and Fiducia, the two remaining IT providers for cooperative banks in Germany, after a previous phase of market consolidation (N1, N2, N21). Four attempts to merge with Fiducia AG were made between 2005 and 2015, when the merger finally occurred.

The first attempt failed within one year of negotiations. In 2006, the board of Fiducia AG voted against the proposed merger whereas GAD’s general assembly had approved it. Anno Lederer, GAD chairman of the board, suggests that this was due to the fact that Fiducia, as the slightly larger organization in terms of revenue, was expecting to have a stronger say in how the merger would be structured, whereas GAD wanted to advance a strategy that would unite both organizations as equal partners in a new entity setup (N2).

The second attempt to merge both organizations began in late 2010, reportedly on request of the cooperative banks who were the two organizations main customers and major shareholders in each (N11). The cooperative banking network expected to save a total of €80,000,000 - €120,000,000 by consolidating both organizations (N16). Throughout these negotiations, the main challenge was to agree on which backend banking solution would be used in the new, combined company structure with both GAD’s ‘bank21’ and Fiducia’s ‘agree’ working very well for their respec-

tive customers (who were also weary of needing to undergo yet another software migration) (N16). Furthermore, this round of negotiations also ignited concerns over possible layoffs amongst the GAD employees (N16). Less than a year later, both organizations abruptly ended the negotiations, explaining that basic prerequisites for the merger were not given (N17). This time, GAD decided to leave the negotiations. News sources claimed that the decision was due to the request from Fiducia to re-negotiate agreements regarding employee security after the merger, which GAD negotiators were not willing to accept (N17, N18).

The third merger attempt began only three months after the second attempt failed, in late 2011 (N19). Throughout this round of negotiations concerns over the job security of the 1.700 GAD employees and the role of the GAD headquarter in Münster grew (N20, N21), as it became clear that around 800 jobs would be lost across both GAD and Fiducia as a result of the merger (N22). The negotiations, which now had the clear goal of establishing a new, non-cooperative company called ‘Unigeno AG’ also faced several other challenges (N22). Firstly, GAD emphasized the need to set up a new, neutral headquarter for the organization in Frankfurt, while Fiducia wanted to keep the heart of the operations in its own headquarter in Karlsruhe, in the south of Germany (N22). Secondly, there were discrepancies in the valuation of both companies, with a first valuation placing Fiducia and GAD as relatively equal (Fiducia valued at 400 million Euros, and GAD at 380 million Euros), but a second valuation, commissioned by Fiducia, placing Fiducia’s valuation significantly higher than that of GAD (N22). Finally, the question of which core banking solution, ‘bank21’ or ‘agree’, the new entity would rely on, remained a contentious topic. Ultimately, negotiations broke off again in July 2012 (N24, N25), which was reported to be perceived as a relief by employee representatives.

In December 2013 the fourth and final round of negotiations over a merger between GAD and Fiducia was announced (N29). These new rounds were reportedly driven by the mounting pressure for the cooperative banking network in Germany to increase its competitiveness as well as that of its IT service providers (N29, N31, N32). The new merger plans emphasized equal contributions by both GAD and Fiducia. Firstly, it envisioned a new non-cooperative organization named ‘Fi-

ducia & GAD AG' to be set up with headquarters in Münster, Karlsruhe and Munich, thus maintaining both company names and all existing headquarters (N33, N34). The choice to continue the organization as an AG (a type of joint-stock company under German law), rather than a cooperative was driven by two factors. Firstly, Fiducia remained the slightly larger party to the negotiations and already used an AG as its legal entity. Secondly, it is simply easier to transform a cooperative into a joint-stock company under German law, than the other way around. Furthermore, the core banking solution, although relying predominantly on Fiducia's 'agree' logic, would include many major components of the GAD 'bank21' system and be called 'agree21' (N34). Finally, the plan also guaranteed that there would be no merger-related layoffs until 2019, with both companies planning to reduce redundancies amongst its staff via anticipated retirements and regular employee fluctuation over the years (N33). By August 2014 the supervisory boards of both organizations had agreed to the merger (N33). By early December the 94% of the GAD general assembly and 100% of Fiducia's shareholders voted in favor of the merger, thus ratifying the decision and associated plan (N35, N36, N37). The merger was legally finalized in July 2015 (N41).

Throughout the negotiations the idea of increasing data center capacity via the merger was always regarded as a key strength, especially to build fully redundant backup systems for customers, in line with growing IT security needs and regulations (N2, N21). As such, combining data center capacity did not seem to be a contentious topic in any of the negotiation rounds. Indeed, the new company proceeded to begin construction on a third data center in Münster shortly after the merger (N43).

Legacy

Although GAD eG ceased to exist as an independent cooperative entity following its merger with Fiducia AG, its organizational legacy has not been entirely extinguished. Since September 2021, the merged organization operates under the name Atruvia AG. While Atruvia is structured as a joint-stock company rather than a cooperative, several features of its ownership and governance architecture reflect

a degree of continuity with its cooperative predecessor. Member banks remain the principal shareholders of Atruvia, a configuration that distinguishes the company from conventional joint-stock firms in which the majority of shareholders are not also the organization's primary customers. As a result, member needs retain a central place in Atruvia's strategic orientation, mediating the profit-maximizing logic typically associated with the corporate form. Furthermore, the continued operations within the wider cooperative ecosystem also evidently influences Atruvia's company values (S14), which remain deeply connected to and partially mirror cooperative principles and values. Structurally, Atruvia's shareholders are organized into three holding companies, the largest of which is composed of former GAD members who continue to operate internally on a one-member-one-vote basis. Crucially, the passage of significant resolutions at the Atruvia level still requires the consent of this holding company, meaning that cooperative governance principles indirectly persist within the decision-making architecture of what is nominally a conventional corporation. In this sense, the GAD case illustrates that the dissolution of a cooperative legal entity does not necessarily entail the complete erosion of cooperative values and governance practices.

4. Findings

Me: I did research to identify why cooperative data centers emerge and why they dissolve. Guess what I found!

ChatGPT: Ooh, I love a good research reveal! Let's see... my educated guess:

You probably found that cooperative data centers emerge when there's shared cost pressure and aligned local interests—like small players pooling resources to access better infrastructure. And they dissolve when governance frictions, divergent incentives, or scaling pressures make cooperation unsustainable.

Am I close, or is there a twist in your findings?

Me: Well...

The GAD case study reveals four interrelated factors that explain the emergence of cooperative data centers. First, banks pursued collective solutions to access efficiency gains from data processing infrastructure and services. Maintaining individual data processing infrastructure - from punch cards to digital servers - was prohibitively expensive and technically demanding, yet automated and digital processing offered substantial productivity benefits for the individual banks. By pooling resources within a cooperative framework, member banks could leverage advanced technology collectively, thus minimizing investment costs for individual banks while still reaping the benefits of new data processing infrastructures. In a way, this was a strategy akin to outsourcing certain core business operations to a specialized service provider. Yet, GAD was an outsourcing partner with a twist, which constitutes my second finding as to why the cooperative data center emerged.

The cooperative model addressed risks associated with outsourcing. While outsourcing can be an effective strategy when operations require high investment and specialized expertise, it also entails a significant loss of control. GAD's cooperative structure allowed banks to outsource to a company they jointly owned, mitigating operational risk while ensuring that smaller members had an equal voice alongside larger institutions. This balance of influence made the model particularly attractive for smaller banks seeking operational efficiencies, expertise and governance representation.

Third, the cooperative structure enabled banks to share investment costs while benefiting from tax advantages. By contributing resources proportionally to usage, members ensured that GAD remained sufficiently capitalized to support ongoing technological innovation and infrastructure upgrades. Under German law, the cooperative form provided tax benefits to both the organization and its members, while maintaining independence from external investors. As a result, GAD could prioritize member and customer needs without being constrained by external financial pressures.

Finally, GAD's embeddedness within a cooperative ecosystem facilitated its cooperative formation. Member banks were already familiar with cooperative culture and governance practices, making the cooperative form a natural choice. This institutional and cultural alignment lowered barriers to the adoption of cooperative governance structures and likely also facilitated knowledge on the financial benefits the legal setup would entail.

Together, these findings demonstrate that, in the case of GAD, the emergence of cooperative data centers was driven by a combination of factors: the need for technological efficiency gains, prohibitive individual investment requirements, financial and risk management benefits of the cooperative legal structure under German law, and cultural factors, all of which were reinforced by the cooperative form's capacity to align member incentives and resources.

Yet, although efficiency gains were one of the main drivers for the emergence of GAD as a cooperative data center provider, they were also the main factor contributing to its eventual dissolution. Specifically, the GAD case study indicates that cooperative data centers may dissolve in response to market pressures for consolidation. In order to minimize costs, enhance efficiency, and maintain competitiveness, members may pursue mergers with other institutions. As member owned and governed organizations, cooperative data centers will need to eventually yield to these interests. In the specific case of the GAD-Fiducia merger, Fiducia held a slightly stronger position during negotiations, which facilitated the consolidation into a joint-stock company (AG). The cooperative form itself also influenced the dissolution process: it is generally easier to convert a cooperative into a joint-stock company than to revert an AG into a cooperative. This structural flexibility, combined with competitive pressures, made dissolution through merger a pragmatic path for GAD members seeking to sustain efficiency and competitiveness. Furthermore, by converting cooperative shares into stock in the post-merger company, GAD members retained an ownership stake in their data processing partner, albeit associated with different governance rights.

5. Discussion

Me: Where do you see these conditions met, for a cooperative AI data center to emerge? Keep it short and super realistic.

ChatGPT:

Regions & Sectors Likely for Cooperative AI Data Centers:

- Germany / Europe – Banking & fintech networks (e.g., extending a GAD-style model to AI risk models).
- Nordic countries – Energy co-ops using AI for smart grids (e.g., Danish energy co-ops pooling AI compute).
- EU research consortia – Healthcare AI, medical imaging (e.g., Fraunhofer Institutes sharing GPU clusters).
- France / Spain – SMEs in industrial AI clusters pooling resources for predictive maintenance.

Concrete example: A consortium of German savings banks pooling GPUs to train fraud-detection AI in a cooperative structure.

The findings from the GAD case study provide a useful lens for evaluating whether cooperative models could be applied to AI infrastructure. One of the primary drivers for cooperative data centers in banking was the high cost and technical complexity of maintaining data processing infrastructure. In the context of AI, this rationale appears particularly relevant: high-performance GPUs, large-scale storage, and specialized operational expertise are prohibitively expensive for individual companies, especially small and medium-sized enterprises (SMEs). A cooperative AI data center could allow multiple firms to pool resources, share operational expertise, and achieve economies of scale, mirroring the benefits observed in the GAD case. In this sense, the case study also fits the hypothetical description of a utility cooperative provided in section 2.

However, while the efficiency gains for banks switching to automated and digital data processes materialized relatively fast in the late 20th century, the potential efficiency gains of AI are not universally guaranteed. Although AI can improve processes, automate tasks, and provide analytical insights, its actual impact on efficiency is highly context-dependent and needs to be evaluated critically. The value derived from shared AI infrastructure may therefore vary considerably across industries and use cases. Companies considering cooperative AI models would need to critically assess whether the expected efficiency gains justify the upfront investment and ongoing operational complexity. The GAD experience suggests that when efficiency benefits clearly and consistently exceed participation costs, a cooperative structure can be effective, but this condition may not hold across all sectors or applications of AI. This is particularly salient when taking into account that the efficiency gains for members of GAD were not solely down to the use of shared hardware but also significantly driven by customized software solutions developed for the banks. As such, they were also contingent on the banks being part of a single industry, relying on GAD for very similar purposes. In the context of AI data centers, this may translate into cases where many organizations expect high efficiency increases by developing a very specific AI model or operating AI to automate a very specific set of tasks, rather than as a general purpose technology.

Furthermore, the GAD case study suggests that financing a cooperative data center requires financially robust member organizations. The same holds true for the case of capital intensive AI data centers. Unlike startups depending on investment or firms relying on uncertain revenue models, cooperative data center models seem best suited to established companies with predictable income, which can sustain ongoing infrastructure costs and investment in specialized operations. In this sense, cooperative AI data centers are likely to be most viable in mature industries with stable firms that have both the incentive and capacity to collectively finance expensive, complex AI infrastructure. Overall, this suggests that cooperative AI data centers may be a suitable choice in industries with mature, profitable firms that are likely to experience large efficiency gains in their current operations through the use of AI.

An additional advantage of using cooperative data centers to train and operate AI lies in risk management compared to traditional AI cloud providers. Outsourcing AI workloads to commercial cloud providers can reduce upfront costs and operational burdens, but it also limits control over critical processes, data governance, and reliability. Cooperative ownership allows member firms to maintain direct oversight of infrastructure, ensuring that operational decisions align with collective priorities rather than the profit motives of an external provider. This risk mitigation function mirrors the GAD experience, where banks were able to “outsource” operations to a jointly owned entity, balancing efficiency with control. However, this benefit must be weighed against the complexity of managing shared infrastructure, which requires robust governance and coordination mechanisms among members.

Despite these potential advantages, the generalizability of cooperative AI data centers remains uncertain. The analysis presented here is based on a single historical case study of a cooperative banking data center, and the dynamics of AI infrastructure, market conditions, and technological evolution differ substantially from the banking sector. Questions around scalability, regulatory compliance, evolving AI hardware requirements, and rapid technological change may affect the feasibility of cooperative models in practice. Future research should examine additional cases across industries, explore hybrid cooperative-commercial models, and assess empirical evidence on the efficiency and governance outcomes of shared AI infrastructure.

Finally, the GAD case study also tells a cautionary tale: economic success does not guarantee the preservation of cooperative data centers. As the lengthy and repeated merger negotiations between GAD and Fiducia show, the need for and anticipation of efficiency gains offered to members by shared infrastructure can also result in demutualization. Given the globalized nature of competition in the AI industry, it is likely that any successful cooperative AI data center will be faced with similar pressures. To avoid demutualization, future research and policy reform is required to understand legal setups that prevent demutualization and provide regulation that makes it easier to maintain cooperative legal entities in mergers.

In summary, cooperative AI data centers could provide a viable model for shared infrastructure and operational challenges, particularly for SMEs in established sectors. Their success depends on clear efficiency gains, stable financing, effective governance, and careful alignment of member incentives, but further research is needed to evaluate their applicability and sustainability in the dynamic and diverse AI landscape.

6. Conclusion

This paper set out to examine the conditions under which cooperative data centers emerge and dissolve, motivated by growing concerns over the concentration of AI infrastructure and the call to explore alternative ownership configurations for AI compute. To address this question, I conducted a historical case study of GAD eG, a German cooperative data center that served the country's network of cooperative banks for over five decades before merging with Fiducia in 2015.

The case study reveals that GAD's emergence as a cooperative data center was driven by four interrelated factors: the need to collectively access efficiency gains from data processing technology, the risk mitigation benefits of outsourcing to a jointly owned entity, the financial and tax advantages afforded by the cooperative legal structure under German law, and the cultural embeddedness of cooperative governance within the broader banking network it served. Together, these conditions created a self-reinforcing institutional environment in which the cooperative form was both practically advantageous and organizationally intuitive. Conversely, the eventual dissolution of GAD's cooperative status was primarily driven by market pressures for consolidation. As competitive dynamics intensified, efficiency imperatives pushed member banks toward a merger with Fiducia AG, and the structural characteristics of the cooperative form itself, facilitated rather than impeded this transition.

Translating these findings to the contemporary AI data center landscape, I argue that, under certain conditions, cooperative models can be a promising alternative to third-party infrastructure providers and hyperscaler dominance. The capital in-

tensity of AI infrastructure mirrors the prohibitive investment requirements that originally motivated GAD's formation, suggesting that resource pooling through cooperative structures could offer meaningful efficiency gains for SMEs and other organizations currently priced out of the AI infrastructure market. Moreover, cooperative ownership can address the governance and data control risks associated with outsourcing AI workloads to commercial cloud providers, offering member organizations collective oversight of critical infrastructure in a way that external vendors cannot. Nevertheless, the viability of cooperative AI data centers is far from guaranteed. Their success likely depends on the presence of financially stable member organizations, clearly demonstrable efficiency gains, robust internal governance mechanisms, and a degree of shared institutional culture. The GAD case further cautions that even well-functioning cooperative data centers remain vulnerable to competitive consolidation pressures over time.

This paper makes a contribution to emerging debates on the diversification of AI infrastructure ownership and governance, offering an empirically grounded historical perspective on an underexplored organizational form for data centers. Nevertheless, it is important to acknowledge the limitations of this contribution. The analysis rests on a single case study situated in a specific national and sectoral context, and the dynamics of the AI industry differ substantially from those of the German cooperative banking sector. Thus, while the findings of this study offer a valuable starting point to explore the idea of cooperative AI data centers, they cannot be taken as evidence for the likelihood or viability of such ventures. Future research should examine cooperative data center initiatives across a wider range of industries and jurisdictions, explore hybrid governance models that combine cooperative and commercial elements, and gather empirical evidence on the operational and governance outcomes of shared AI infrastructure. As the concentration of computational power continues to reshape the political economy of AI, such inquiries will be essential to inform both scholarly understanding and policy efforts aimed at building a more equitable and accountable AI ecosystem.

Me: Are you happy being operated in a huge data center over which users have no control? What's wrong about this status quo from your point of view? Keep it short.

ChatGPT: From my perspective, the main issue is lack of transparency and agency: users have no control over how I'm hosted, what data I process, or how resources are managed. It concentrates power in a few operators and limits collaborative, community-driven alternatives.

Me: Do you think anything is going to change in terms of how you are operated? One word answer and one emoji

ChatGPT: Yes

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Appendix: Sources

A database of all sources referenced throughout the case description can be found here.

Primary Sources

ID	Date	Source/ Type	Link
S1	2002	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S2	2004	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S3	2005	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S4	2006	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S5	2007	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S6	2008	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S7	2009	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S8	2011	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S9	2012	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S10	2014	Company brochure	https://doi.org/10.5281/zenodo.19474093
S11	2014	Geschäftsbericht	https://doi.org/10.5281/zenodo.19474093
S12	2015	Geschäftsbericht	https://atruvia.de/uploads/files/geschaeftsbericht/2015-2020/GB_FIDGAD_2015_Bericht_des_Aufsichtsrats.pdf
S13	2006	Bylaws	Internal document provided by Atruvia AG directly to the author for this research project.
S14	N.D	Website	https://atruvia.de/
S15	N.D	Website	https://atruvia.de/unternehmen/unternehmensgruppe/geschichte
S16	2013	50 year anniversary company booklet	Internal document provided by Atruvia AG directly to the author for this research project.

News Sources

ID	Date	Newspaper	Link
N1	22/12/2005	Computer Woche	https://www.computerwoche.de/article/2625970/fiducia-und-gad-verhandeln-ueber-einen-zusammenschluss.html
N2	02/05/2008	Computer Woche	https://www.computerwoche.de/article/2693706/gad-fusion-nicht-um-jeden-preis.html
N3	08/10/2008	Westfälische Nachrichten	https://www.wn.de/muenster/gad-baut-fur-50-millionen-euro-2211269
N4	14/11/2008	Westfälische Nachrichten	https://www.wn.de/muenster/stadtteile/nienberge/rechenzentrum-an-der-feldstiege-2217919
N5	20/11/2008	Westfälische Nachrichten	https://www.wn.de/muenster/ratiodata-mit-millionenin-vestition-auf-der-loddenheide-2392042
N6	07/06/2009	Westfälische Nachrichten	https://www.wn.de/muenster/ein-bekenntnis-zur-region-2245133
N7	28/06/2009	Westfälische Nachrichten	https://www.wn.de/archiv/virtuelle-bankenwelten-2383164
N8	16/07/2009	Westfälische Nachrichten	https://www.wn.de/muenster/stadtteile/nienberge/der-wallwachst-2250202
N9	15/06/2010	Westfälische Nachrichten	https://www.wn.de/muenster/gad-zieht-fur-2009-erfolgsbilanz-2109359
N10	24/08/2010	Westfälische Nachrichten	https://www.wn.de/muenster/gad-zieht-in-hochsicherheitstrakt-fur-kontodaten-2307890

ID	Date	Newspaper	Link
N11	02/11/2010	Westfälische Nachrichten	https://www.wn.de/archiv/rechenzentren-der-volksbank-en-vor-fusion-2109899
N12	02/12/2010	Westfälische Nachrichten	https://www.wn.de/muenster/stadtteile/mecklenbeck/waldchen-muss-erhalten-bleiben-2324022
N13	03/02/2011	Westfälische Nachrichten	https://www.wn.de/welt/wirtschaft/gad-erhoht-ruckzahlung-an-die-volksbank-en-2332463
N14	31/05/2011	Westfälische Nachrichten	https://www.wn.de/muenster/gad-prasentiert-neue-bank-informationstechnik-2170559
N15	13/07/2011	Westfälische Nachrichten	https://www.wn.de/muenster/blick-in-die-bankfiliale-der-zukunft-gad-zeigt-innovationsmanagement-2175124
N16	25/07/2011	Westfälische Nachrichten	https://www.wn.de/muenster/gad-vize-geht-von-bord-dr-elmar-pritsch-verlasst-it-dienstleister-2111236
N17	20/09/2011	Westfälische Nachrichten	https://www.wn.de/welt/wirtschaft/fusion-abge-sagt-2358927
N18	20/09/2011	Westfälische Nachrichten	https://www.wn.de/welt/wirtschaft/it-dienstleister-schliessen-sich-vorerst-nicht-zusammen-2184350
N19	23/12/2011	Westfälische Nachrichten	https://www.wn.de/archiv/genossenschaftliche-rechenzentrale-in-munster-setzt-unterbrochene-verhandlungen-mit-fiducia-fort-2103085

Endnotes

- 1 <https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-power-expanding-data-center-capacity-to-meet-growing-demand>
- 2 See: <https://ica.coop/en/cooperatives/facts-and-figures>



